



Early postoperative nutrition improves outcome

CON

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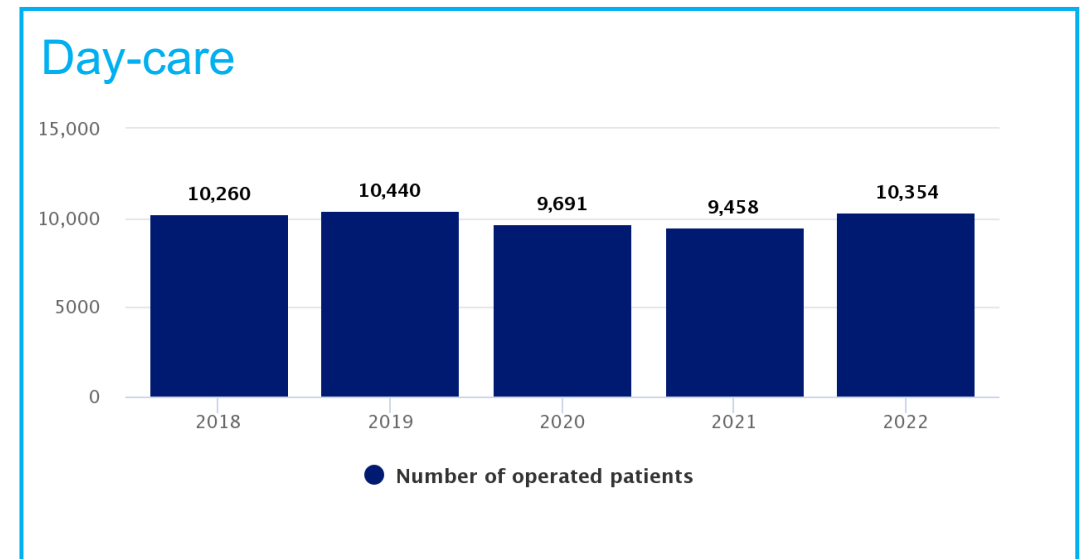
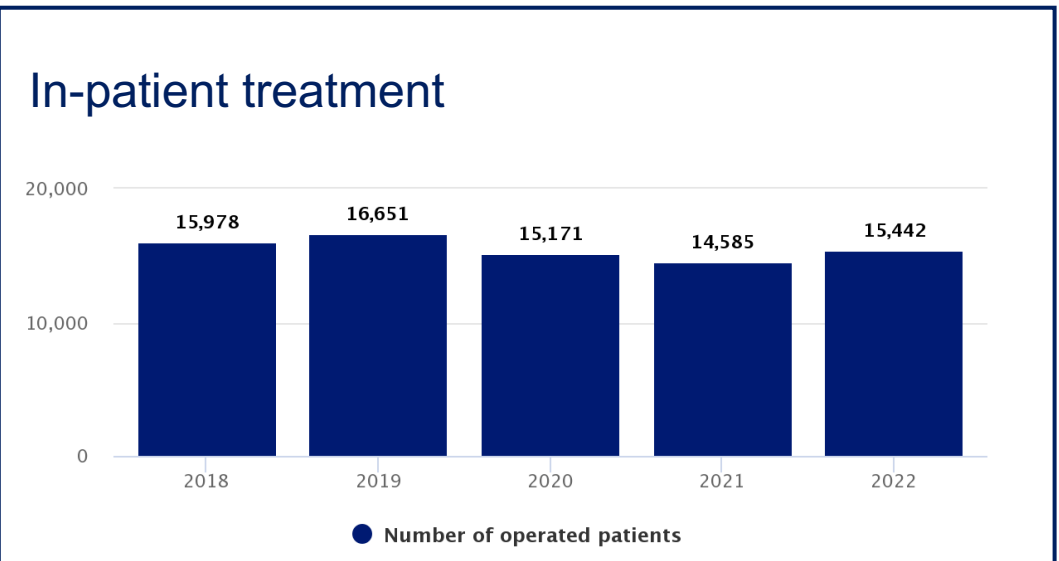
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Estonia

What is the target population?

- Elective surgery?
- Emergency surgery?
- Gastrointestinal surgery?
- ICU postoperative patients?



What is the target population?

- Elective surgery?
- Emergency surgery?
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What are the outcomes?

- Mortality?
- Severe complications?
- Hospital length of stay?

What is the intervention?

- Oral diet?
- Enteral nutrition?
- Parenteral nutrition?
- What is early?
 - ≤ 24 hours?
 - ≤ 48 hours?



Herbert G, et al. **Early enteral nutrition within 24 hours of lower gastrointestinal surgery versus later commencement for length of hospital stay and postoperative complications.** Cochrane Database Syst Rev. 2019 Jul 22;7(7):CD004080

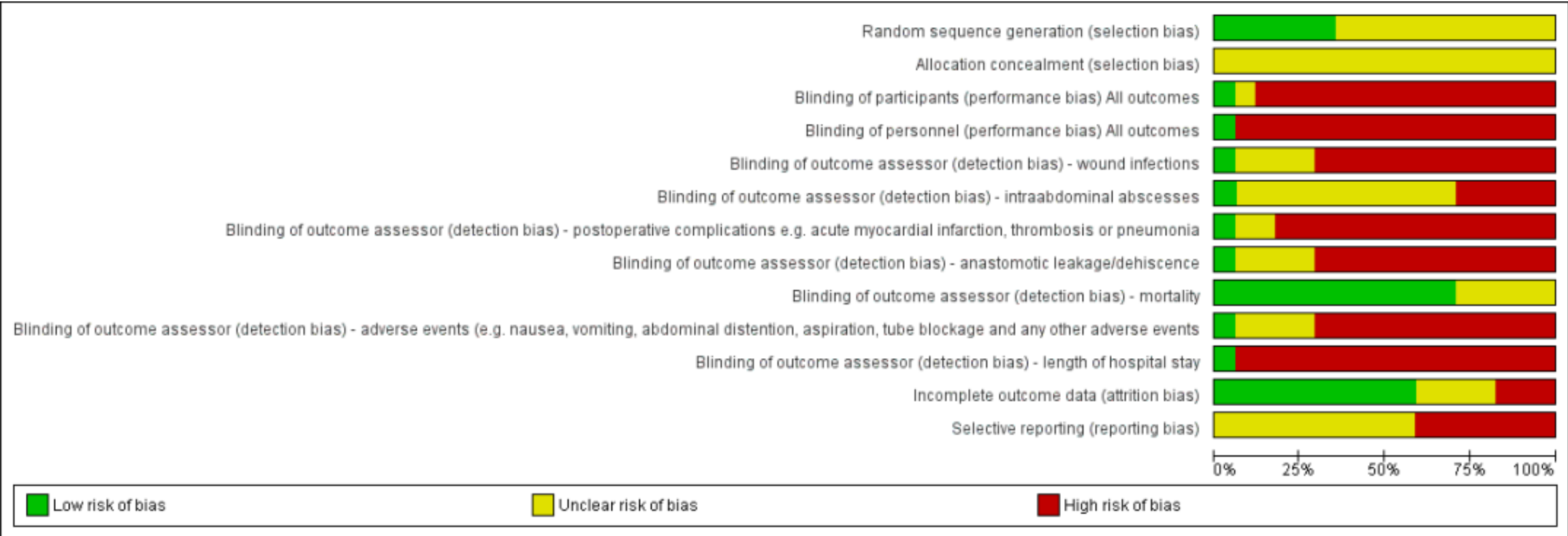
PICO element	Description
Population	<ul style="list-style-type: none"> • Lower GI surgery (below ligamentum Treizi) • adults >18 yrs, in-hospital setting
Intervention	<ul style="list-style-type: none"> • Early enteral nutrition (oral or tube feeding within 24 hours)
Comparator	<ul style="list-style-type: none"> • EN nutrition later
Outcomes	<ul style="list-style-type: none"> • Length of hospital stay
	<ul style="list-style-type: none"> • Complications (anastomotic leak, intra-abdominal abscesses, wound infection, pneumonia, nausea and vomiting)
	<ul style="list-style-type: none"> • Mortality

Population and reported outcomes

- **17 randomized controlled trials with 1437 participants**

Outcome	No of studies	No of participants
• Length of stay	16	1346
• Wound infection	12	1181
• Intraabdominal abscesses	6	554
• Anastomotic leakage/dehiscence	13	1232
• Pneumonia	10	954
• Mortality	12	1179
• Vomiting	7	613

Most studies were at high or unclear risk of bias in two or more domains



Mortality

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No. of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk with no calories	Corresponding risk with early enteral nutrition				
Mortality	30 per 1,000	17 per 1,000 (6 to 46) (24 fewer to 16 more)	RR 0.56 (0.21 to 1.52)	1179 (12 RCTs)	⊕⊕⊕⊕ LOW ⁴	Absolute risk reduction: 0.013 Thus, for every 1000 participants receiving early feeding, 13 less mortality compared to later commencement. Trial Sequential Analysis showed that the information size was not large enough to rule out that early feeding versus control reduces the risk ratio of mortality by 30% or more

- Mortality was reported in 12 studies (1179 participants), and showed **no between-group differences (RR = 0.56, 95%CI, 0.21 to 1.52, P = 0.26, I₂ = 0%, Chi₂ = 3.08, P = 0.96, low-quality evidence)**.
- The most commonly reported cause of death was anastomotic leakage, sepsis and acute myocardial infarction.

Severe complications

Complication	Anticipated absolute effect		Risk Ratio	95%CI	QoE Grade
	Control	EEN			
Wound infection	91 per 1000	91 per 1000 (33 fewer to 47 more)	0.99	0.64 to 1.52	Very low
Anastomotic leakage/dehiscence	47 per 1000	37 per 1000 (18 fewer to 29 more)	0.78	0.38 to 1.61	Low
Intraabdominal abscesses	29 per 1000	29 per 1000 (21 fewer to 81 more)	1.00	0.26 to 3.80	Low
Pneumonia	21 per 1000	18 per 1000 (14 fewer to 30 more)	0.88	0.32 to 2.42	Low
Vomiting	231 per 1000	284 per 1000 (9 fewer to 134 more)	1.23	0.96 to 1.58	Low

Trial Sequential Analysis showed that the information size was **not large enough** to rule out that early feeding versus control reduces the risk ratio of the complications by set target

Length of hospital stay

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No. of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk with no calories	Corresponding risk with early enteral nutrition				
Length of hospital stay (days)	The mean LoS of control groups ranged from six to 24 days	MD 1.95 lower (2.99 lower to 0.91 lower)	-	1346 (16 RCTs)	⊕⊕⊕⊕ LOW ¹	Trial Sequential Analysis showed that the boundary for benefit was crossed. This indicates that early feeding seems to decrease the mean length of hospital stay by at least one day if risk of bias and other threats to the validity can be disregarded

Mean difference (MD) in LoS was **1.95 (95% CI, -2.99 to -0.91, P < 0.001) days shorter** in the EEN group.

What are the factors determining the length of hospital stay?

Does early postoperative nutrition improves outcome?

We believe in it, but in reality we do not know...

At least, early EN is not worst than „nil per os“...

... in this subgroup of patients

Is there any population where early postoperative EN may cause harm?

- GI perforation and peritonitis?
 - Requiring ICU admission
 - Anrepaired anastomotic leak and fistulas
 - High output stomas
- Acute mesenteric ischaemia?
 - After reperfusion therapy

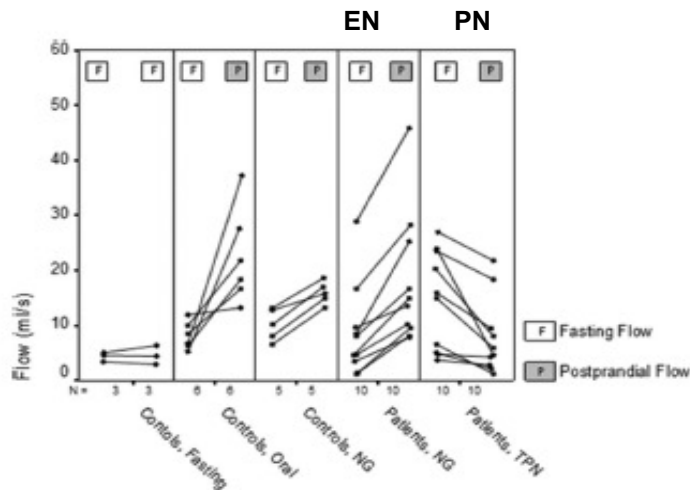


GI perforation and peritonitis

- **Data from elective surgery should not be automatically extrapolated to emergency surgery in critically ill patients!**
- No strong evidence
- EN (rather than PN) should be preferred unless **discontinuity** or **obstruction of gastrointestinal tract**, or **abdominal compartment syndrome** is present
- In the case of an unrepaired anastomotic leak, internal or external fistula, or if distal feeding access is not achieved, **EN should be withheld** and PN may be commenced

Acute mesenteric ischaemia

- Enteral feeding increases the splanchnic blood flow and oxygen demand in healthy volunteers¹ and critically ill patients²
- Early institution of full enteral nutrition in ICU patients may cause bowel ischaemia³



EN vs PN, normocaloric goals (20-25 kcal/kg/day), within 24 h after intubation

Gastrointestinal complications					
Vomiting*	406 (34%)	246 (24%)	..	1.89 (1.62 to 2.20)	<0.0001
Diarrhoea*	432 (36%)	393 (33%)	..	1.20 (1.05 to 1.37)	0.009
Bowel ischaemia*	19 (2%)	5 (<1%)	..	3.84 (1.43 to 10.3)	0.007
Acute colonic pseudo-obstruction*	11 (1%)	3 (<1%)	..	3.7 (1.03 to 13.2)	0.04

1) Takala J. Br J Anaesth. 1996; 77(1):50-8

2) Gatt M, et al. Crit Care Med. 2009; 37(1):171-6

3) Reignier J, et al. (NUTRIREA-2). Lancet. 2018;391(10116):133-143

In summary - does early postoperative nutrition improves outcome?

- The effectiveness of early **postoperative** nutrition has not been convincingly proven, and the evidence is either lacking or weak
- Early nutrition alone is not a magic solution; instead, it is a complex set of measures that improve outcomes
- Not all surgical patients require the same level of nutritional support
- In some cases, there may be contraindications to early postoperative (enteral) nutrition
- Individualized care is essential



I WROTE DOWN
ALL OF YOUR
OPINIONS
THAT MATTER
TO ME
AND PUT
THEM IN
THIS
BOX.



BLUNT CARD

IT'S EMPTY.



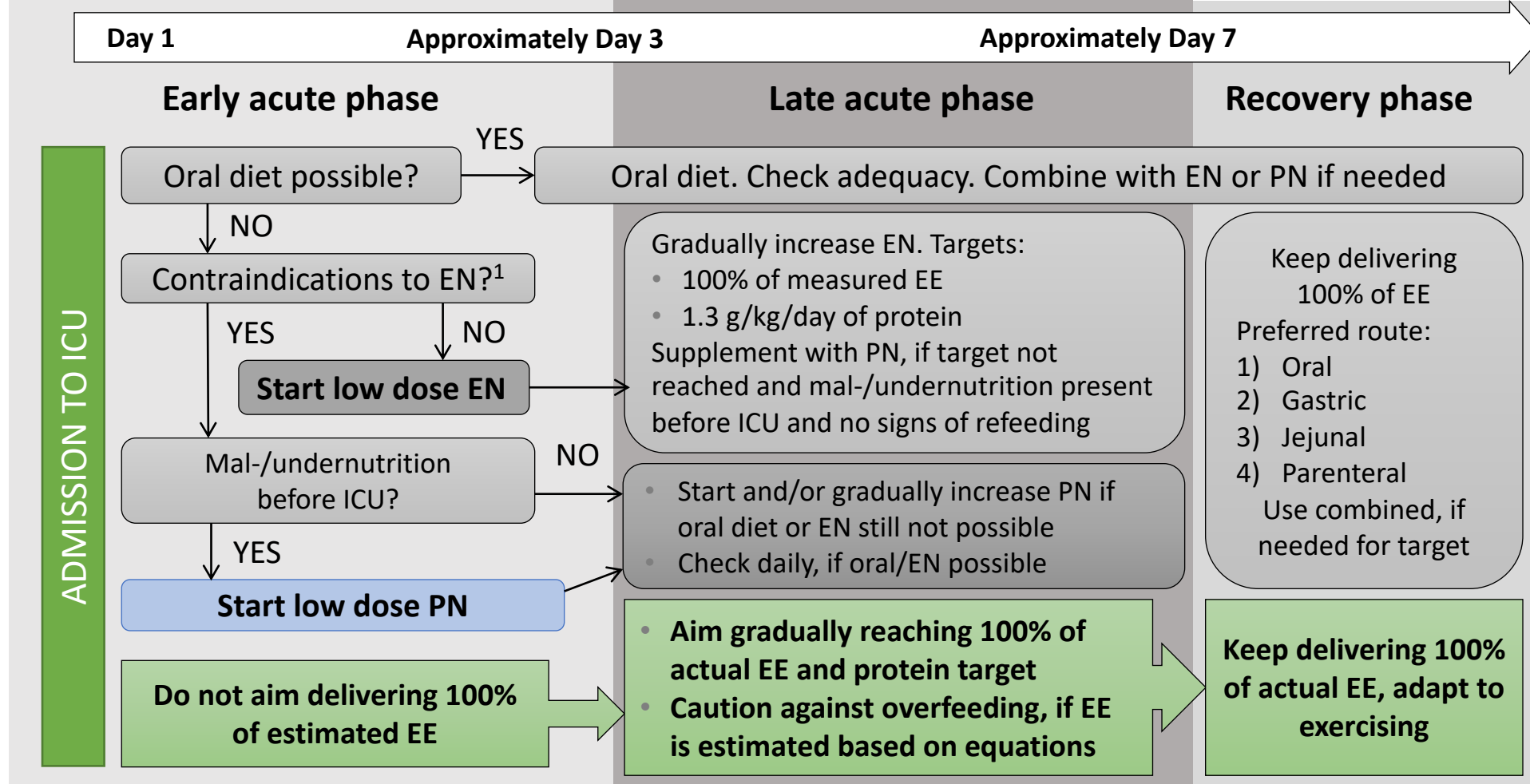


TARTU ÜLIKOOL



Tartu Ülikooli Kliinikum





- Full targets: measured EE or 20-25 kcal/kg/day, and 1.3 g/kg/day of protein
- For obese: use adjusted body weight
- If gastroparesis: 1) erythromycin, 2) +metoclopramide, 3) jejunal tube
- Consider non-nutritional calories, adapt nutritional calories accordingly
- Check prescribed vs. administered calories
- Assess gastrointestinal signs and symptoms daily
- Anticipate, monitor and manage refeeding
- Monitor overfeeding

¹ contraindications to EN:
 uncontrolled shock, uncontrolled hypoxemia, hypercapnia or acidosis, active upper GI bleeding, overt bowel ischaemia, abdominal compartment syndrome, high-output fistula without distal feeding access, GRV >500ml/6h